Cross Site Scripting

By
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About Me

Student of Cybersecurity, M.S. at NYIT, Vancouver

Worked about 6 years at Accenture and would start with bugcrowd soon

Very excited to speak here for the first time

Agenda

- XSS Overview
- Impact & types
- Public exploits
- Prevention

NOTE: Identify one incorrect slide

One slide in this presentation will not state facts

Do you know who is Samy Kamkar?

Right now: Security Researcher

In 2005 : **“Samy is my hero”** said the description of millions of Myspace accounts

Why?

Answer: The Samy Worm

Samy Worm code


```
<script id=worm>
   var headerTag = "<script id=\"worm\" type=\"text/javascript\">";  ①
   var jsCode = document.getElementById("worm").innerHTML;          ②
   var tailTag = "</" + "script>";                                  ③

   var wormCode = encodeURIComponent(headerTag + jsCode + tailTag); ④

   alert(jsCode);
</script>
```

Cross-site scripting (XSS)

- Type of injection attack
- Malicious client-side scripts are injected
- Attacks are super common and difficult to prevent holistically
- Common occurrence within the OWASP Top 10

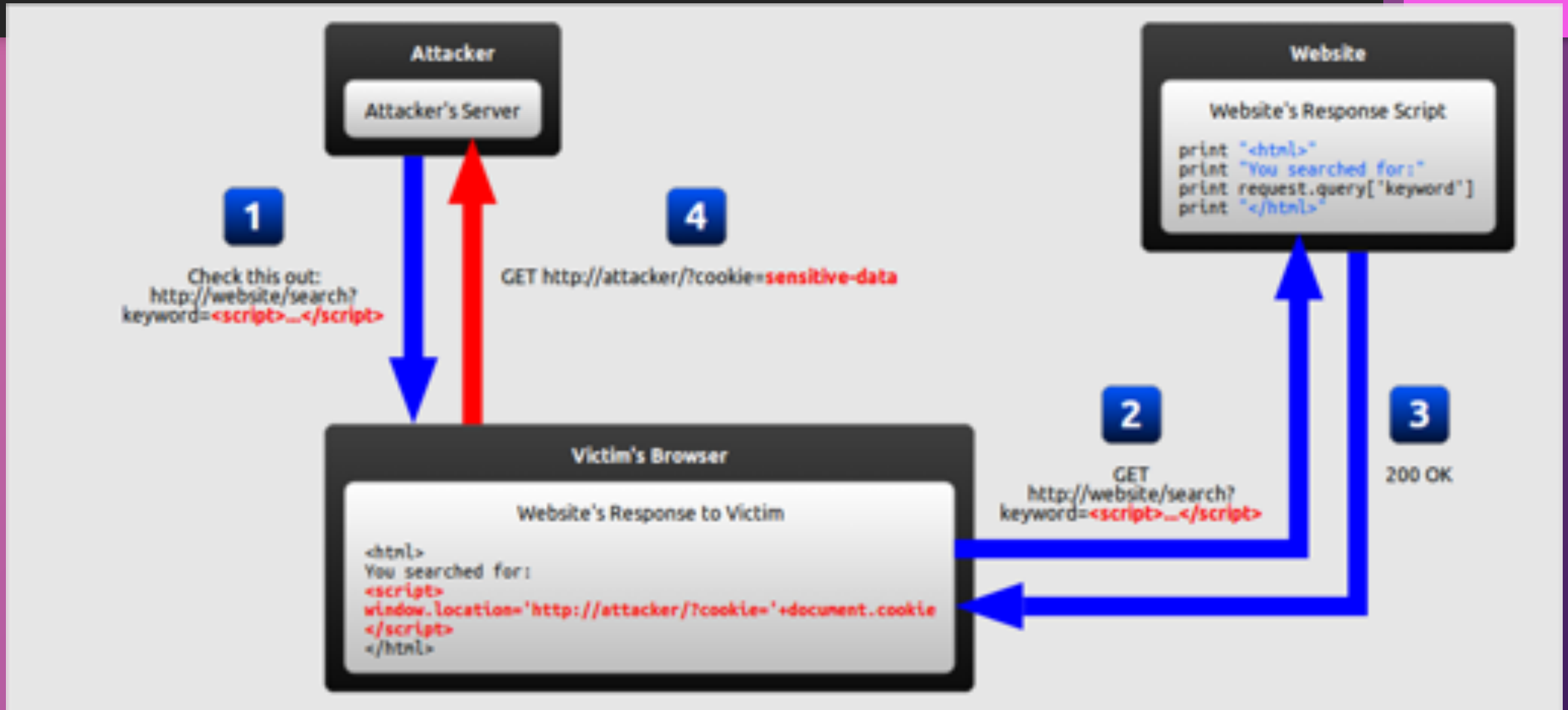
XSS Impact

- Users and/or employees
- Website's ability to generate revenue
- PR damage
- Crashing social media, plugins and online news sites or other online businesses
- Impacts the users first; bad user experience may lead to decreased customer base
- Data theft

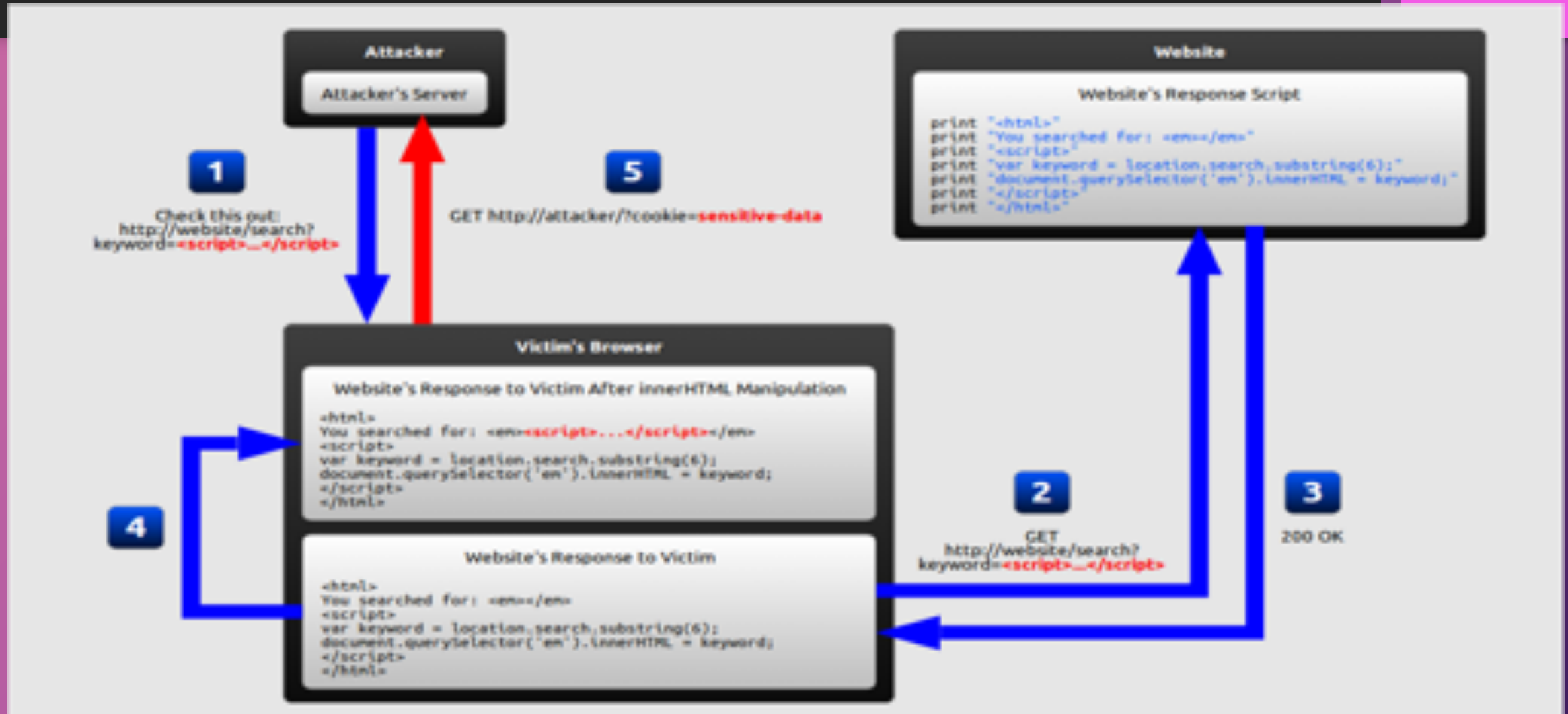
XSS types

- Four types of XSS vulnerabilities
  - Stored
  - XML-based
  - Reflected
  - DOM

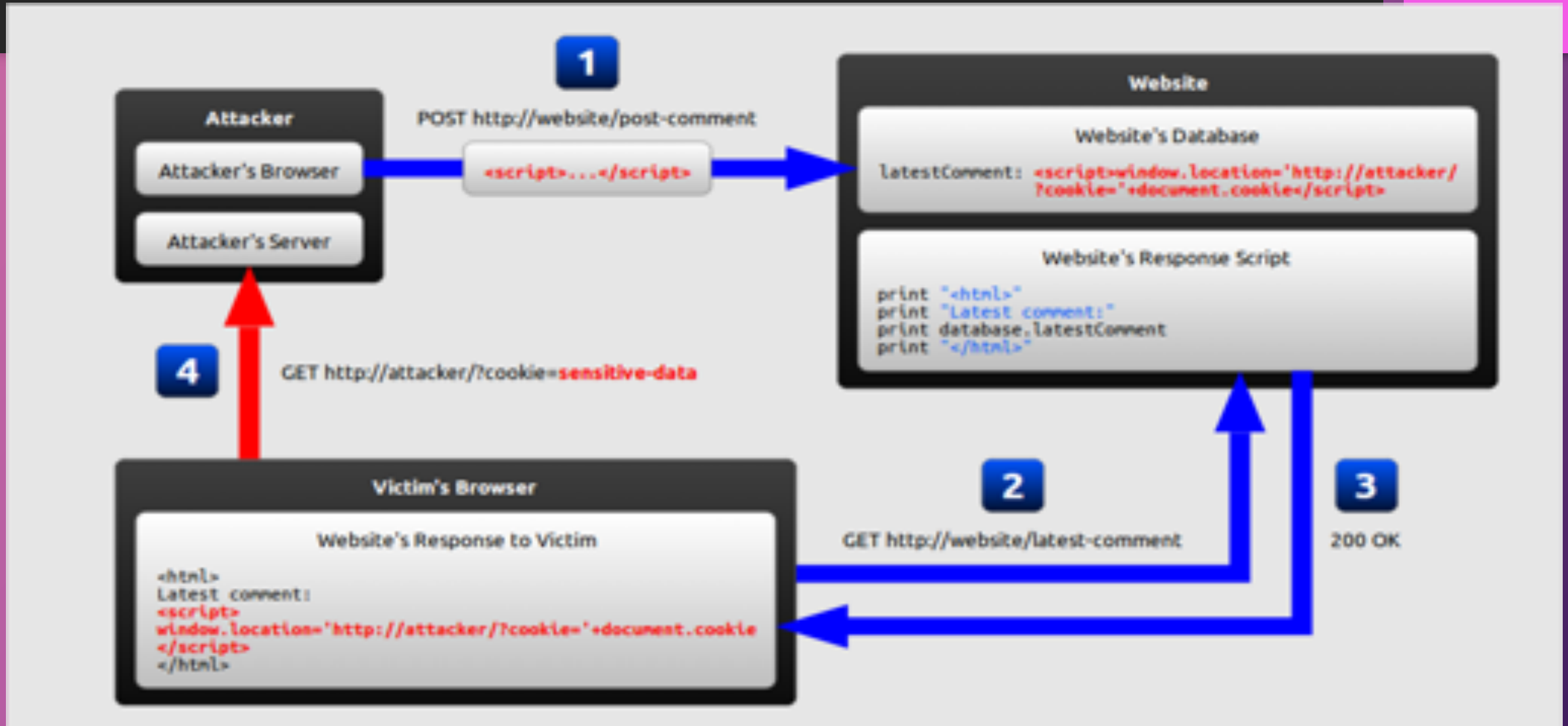
Reflected Cross-Site Scripting



DOM Cross-Site Scripting



Stored Cross-Site Scripting



A few more recent hacks

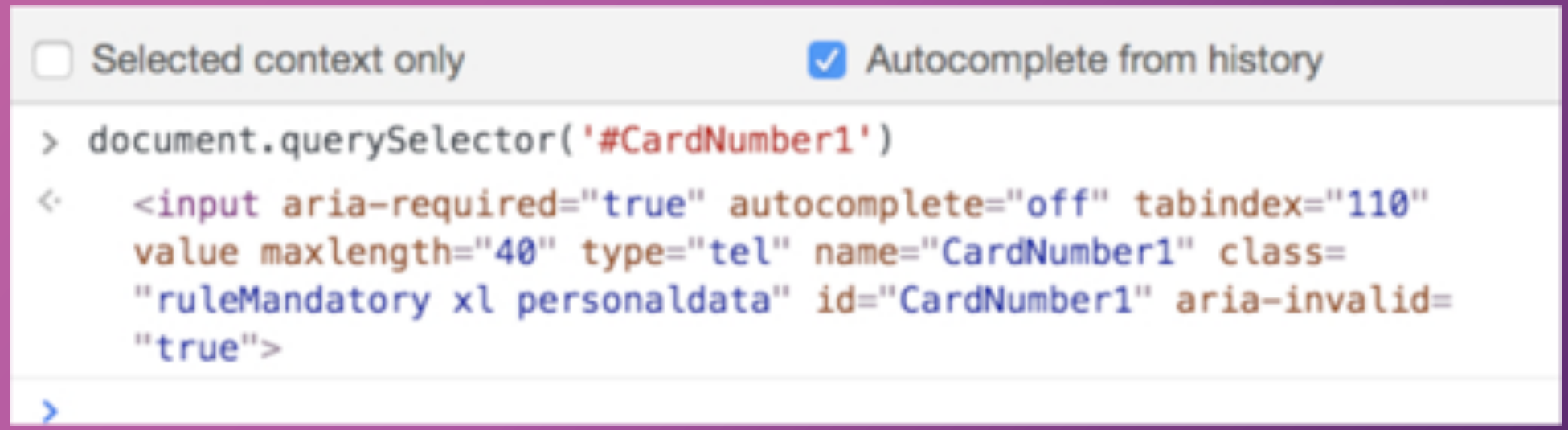
- TweetDeck, 2014
- British Airways, 2018
- Fortnite-Epic Games, 2019
- WordPress Plugin, 2020

TweetDeck, 2014

- XSS Worm - everyone who fell victim for it retweeted it
- Retweet of itself, and spread 38,000 times in two minutes
- Changed the font to Comic Sans
- No monetary loss at first
- Ultimately tweetDeck had to be shut down

British Airways, 2018

- ❑ How many customers were impacted? Any guesses?
- ❑ Customer Information stolen
- ❑ No <iframe> isolation of the payment card fields on the BA payment



WordPress Plugin, 2020

- Over 900,000 WordPress websites targeted
- Website takeover by creation of new administrator accounts
- The plugin accounts for over one million active installations
- Vulnerability disclosed by Wordfence Threat Intelligence team on April 29, 2020
- Issued with a CVSS score of 8.8

A Few Prevention techniques

- ❑ Determine safe UI and reject others
- ❑ Restrict/limit text characters
- ❑ Improperly formatted data shouldn’t be inserted in code
- ❑ Input validation for database queries
- ❑ Security of third-party/ in-house web apps
- ❑ Continuous scanning in real-time to detect any unauthorized code
- ❑ Use modern frameworks like React

Takeaways

- Immediate Victim of XSS are the users
- Updating the plugins could have prevented WordPress plugin attack
- Best defense is sanitization of any and all user input

❖ Special thanks to Jeevan, Arti and Betsy for helping me prepare this presentation

XSS types

- Three types of XSS vulnerabilities
  - Reflected
  - DOM
  - Stored
  - ~~XML-based~~

British Airways Attack

380,000 customers were affected

References

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